

BOTANY

PAPER—I

Time Allowed : Three Hours

Maximum Marks : 200

QUESTION PAPER SPECIFIC INSTRUCTIONS

**Please read each of the following instructions carefully
before attempting questions**

There are EIGHT questions in all, out of which FIVE are to be attempted.

Question Nos. 1 and 5 are compulsory. Out of the remaining SIX questions, THREE are to be attempted selecting at least ONE question from each of the two Sections A and B.

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

All questions carry equal marks. The number of marks carried by a question/part is indicated against it.

Answers must be written in ENGLISH only.

Neat sketches may be drawn, wherever required.

SECTION—A

1. (a) What is a systemic fungicide? Describe the characteristics of an ideal fungicide. 2+6=8
(b) Describe Hfr strains of bacteria. How do they mediate bacterial recombination? 4+4=8
(c) What are mycoplasmas? Compare mycoplasma with protoplasts and spheroplasts. 4+4=8
(d) Describe the various elementary processes associated with the telome theory. Explain the origin of reproductive structures in ferns. 5+3=8
(e) Highlight the salient features of progymnosperms, and discuss their affinities with pteridophytes and gymnosperms. 4+4=8
2. (a) Describe streptococci, staphylococci and sarcinae arrangements of cocci forms of bacteria. Explain homo- and hetero-polysaccharides found in bacterial cell wall. Draw and label the peptidoglycan structure of a typical Gram +ve bacteria. 6+4+5=15
(b) Discuss the various anatomical features of gametophyte and sporophyte of a member of Polytrichaceae. Comment on the significance of these features in relation to environmental conditions. 5+5+5=15
(c) Give an account of reserve food material found in various classes of algae. Add a note on the algae in medicine. 6+4=10
3. (a) What are the different types of interactions among microbes in soil? Discuss their role in soil ecosystem. 10+5=15
(b) Explain the xerophytic and hydrophytic characters of *Equisetum*. Give a comparative account of spore-bearing structures of *Selaginella* and *Equisetum*. 5+5+5=15
(c) "Gnetales are considered as a highly advanced group among gymnosperms." Justify the statement by commenting on the vegetative and reproductive characters. 5+5=10
4. (a) What are the symptoms of sheath blight of rice? Name its causal organism, and describe the disease cycle and its management. 5+2+4+4=15
(b) Discuss the general characteristics, range of thallus organization, and asexual and sexual mode of reproduction in Chlorophyceae. 4+4+4+3=15
(c) Explain coralloid roots with suitable diagram. How do they differ from the normal roots of *Cycas*? 5+5=10

SECTION—B

5. (a) Differentiate between the floral characters of Magnoliaceae and Euphorbiaceae. Name two species of each of these families with their economic importance. 4+4=8
- (b) Distinguish between artificial and natural system of classification. What are their merits and demerits? 4+4=8
- (c) Discuss the importance of ethnobotany in the evolution of modern medicine. How have the cultural and religious practices in India been helpful in ethnobotanical studies? 4+4=8
- (d) What is gynogenesis? How is it different from androgenesis? 2+6=8
- (e) Comment on the importance of botanical gardens in India. 8
6. (a) Distinguish between diplospory and apospory with suitable examples. 7+8=15
- (b) Write short notes on the following : 5×3=15
- (i) Supportive evidences from palynology in taxonomy
 - (ii) Principles of ICN
 - (iii) Importance of herbaria in taxonomy
- (c) What are protoplasts? Describe briefly the protocol for enzymatic isolation of protoplasts. 2+8=10
7. (a) Write the botanical name, family and the uses of the plants from where the following products are obtained : 3×5=15
- (i) Resin
 - (ii) Jute
 - (iii) Cassava
 - (iv) Long pepper
 - (v) Pyrethrum
- (b) (i) In a plant, both direct and indirect shoot regenerations are possible. Which method will you prefer and why?
- (ii) Give an example for cybrids produced through cell fusion and their importance. 8+7=15
- (c) Describe the various events during fertilization starting from pollen germination to fertilization in angiosperms. 10

8. (a) Give a detailed account of centres of origin of cultivated plants with reference to Vavilovian concept. Differentiate between the primary and secondary centres of origin. Name two plants of New World, presently cultivated in the Old World at large scale. 6+5+4=15
- (b) Describe the various stages of micropropagation. How can you use this technology to reduce pressure on natural populations of endangered and threatened plants? 12+3=15
- (c) Describe the structure of stomata with a labelled diagram. Distinguish between haplocheilic and syndetocheilic stomata. 5+5=10

★ ★ ★